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SOURCE Documentary as indicated. (Information requested.)

RECENTLY PUBLISHED RESEARCH OF THE PHYSICOTECHNICAL  
INSTITUTE ACADEMY OF SCIENCES, UKRAINIAN SSR, KHARKOV

"Thermal Conductivity of Bismuth at Low Temperature,"  
S. Shelyt, Phys Tech Inst, Acad Sci, Ukrainian SSR,  
Kharkov

"Jour Phys USSR" Vol 9, 1945, pp 149

Minor additions.

"Elevation of the Yield Point on Annealing of Twinned Calcite," R. I. Garber, Phys Tech Inst, Acad Sci. Ukrainian SSR, Kharkov.

"Zhur Eksp. i Teoret. Fiziki" Vol 16, 1946, pp 923-7

Even though stress-relieving annealing of cold-worked crystals was generally found to result in a lowering of the yield point Y, renewed rise in Y on further annealing at a higher temperature (780° for NaCl) was also observed. Elucidation of the relation between inner elastic stresses and strength was sought by measurements on calcite crystals where twinning in plastic deformation, resulting in enhanced strength, gives rise to no macroscopic stress regions. Rhombohedral-prismatic plates 8-20 mm long, the cross section (3 x 4 to 7 x 9 mm) coinciding with the symmetry plane of the twins, were subjected to deformation resulting in a twinned layer along the cross section. The yield point Y was determined by microscopic observation of the twin layer under increasing loads; the same determination was repeated after annealing. Only in 5 cases out of 24 did Y remain unchanged;

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these cases include anneals from 12 hours at 430° to 10 minutes at 220°, rate of cooling 240-320°/hour. In all the remaining cases,  $\gamma$  rose after annealing, the ratio of increase being for example, 1.51 (5 minutes at 460°), 3.5 (8 hours at 440°), and 4.3, 5.35, 5.69 (from 40-50 to 185-262 g/sq. mm) for three samples treated together (7 hours at 510°). There is no explanation for the unchanged  $\gamma$  in five cases, nor is there any obvious relation between the change in  $\gamma$  and the conditions of annealing. It has, however, been established that annealing of twinned calcite never results in a lowering of  $\gamma$  and mostly raises it. The residual changes can only be located at the boundaries between the twinned layer and the unaffected part of the crystal. That the latter are not modified was demonstrated by restoration of the original condition through reversal of twinning and subsequent renewed twinning deformation. A new twinning layer, produced after annealing of the original one, shows the usual low  $\gamma$ , about 100 g/sq. mm as compared with about 300 for the annealed layer.

"The Interaction of  $\gamma$ -Rays With Matter and the Spectroscopy of  $\gamma$ -Radiation," O. D. Latyshev, Physicotech Inst, Acad Sci, Ukrainian SSR, Kharkov

"Revised Modern Physics" Vol 19, 1947, pp 132-45

A discussion of the work by the author, et al, with the magnetic spectrograph. The relative  $\gamma$ -line intensities for Ra C obtained from a study of its recoil electron spectra and internal conversion positron spectra are as follows: 0.50, 1.00, 0.37, 0.41, 2.42, 0.40, 0.54, 0.71, 1.19, 0.44, 0.56, 2.41, for the lines 2,420, 2,500, 2,690, 1,620, 1,761, 1,690, 1,620, 1,520, 1,370, 1,290, 1,234, and 1,120 kev. The relative  $\gamma$ -line intensities for Th(C + C') obtained from a study of its natural  $\beta$ -ray spectra and recoil electron spectra are as follows: 10.0, 6.5, 11.0, 6.5, 10.0, 100 for the lines 1,350, 1,500, 1,600, 1,800, 2,200, and 2,620 kev. The effective cross sections of the photoeffect per atom in Cu, Ag, Th, and Pb, obtained from a study of their photoelectron spectra, determined with an improved spectrograph, were found to be in the ratio  $(1 \pm 0.2) : (9.5 \pm 1.1) : (74 \pm 8) : (120 \pm 11)$ . This cross section,  $\sigma_e$ , varies with  $Z$  in the interval from  $Z = 29$  to  $Z = 82$  in the manner  $\sigma_e = k \cdot Z^2$ ;  $n = 4.6 \pm 0.25$ . The absolute value of  $\sigma_e$  for Pb was found to be  $(1.3 \pm 0.41) \times 10^{-24}$ , in agreement with the theoretical value. The conclusions of the Dirac relativistic quantum mechanics in the region of several mev energies are adequately verified by experiment. Twenty-one references.

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